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09/740,016	12/20/2000	Shi-Tron Lin	06484.0074	4271

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EXAMINER
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NADAV, ORI

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 06/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/740,016

Applicant(s)

LIN ET AL.

Examiner

ori nadav

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-88,92-96,99-116 and 121-124 is/are pending in the application.
- 4a) Of the above claim(s) 1-82 and 93-95 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 83-88,92,96,99-116 and 121-124 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 24 February 2003 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

Art Unit: 2811

## **DETAILED ACTION**

### ***Drawings***

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 2/24/2003 have been disapproved because they introduce new matter into the drawings. 37 CFR 1.121(a)(6) states that no amendment may introduce new matter into the disclosure of an application. The original disclosure does not support the showing of plurality of current divider segments, wherein each of the segments formed within the first diffusion region being closer to the channel than to the contact region, as recited in claim 121.

### ***Claim Objections***

2. Claim 123 recites the limitation "the channel region" in line 10. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Art Unit: 2811

4. Claims 121-122 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support in the specification, as originally filed, for plurality of current divider segments, wherein each of the segments formed within the first diffusion region being closer to the channel than to the contact region, as recited in claim 121.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

6. Claims 83, 87, 88, 92, 96, 101-109, 112-116 and 121-124, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 102(e) as being anticipated by Hsu et al. (6,236,073).

Hsu et al. teach in figure 5 and related text an electrostatic discharge protection device, comprising: a substrate 120 (figure 4); a first diffusion region 122 formed in the substrate; a second diffusion region 124 formed in the substrate adjacent to and

Art Unit: 2811

spaced from the first diffusion region; plurality of contacts contact 130 for making a conductive connection to the first diffusion region; a channel (the area under gate 126) formed in a third region between the first and second diffusion regions; and a plurality of current divider segments 140 randomly distributed within the first diffusion region, wherein the different shapes are selected from a square, a circle, a cross shape, a T shape, a V shape, a U shape, and an L shape, and the plurality of segments includes a first row of segments; each one of the first row of segments has a center-of-area, the respective centers-of-area are not aligned, wherein the plurality of segments are formed of polysilicon segments, field oxide segments, or a combination of polysilicon and field oxide segments, and wherein the segments include a first segment spaced apart by a first gap from an adjacent second segment; the segments further include a third segment spaced apart by a second gap from an adjacent fourth segment; and the first gap being larger than the second gap, wherein the second segment is the third segment, a dielectric layer 125 formed over the channel, a conductive element 126 formed over the dielectric layer, wherein the conductive element is a polysilicon gate element; and the dielectric layer is an oxide layer, wherein at least one of the segments is positioned between the at least one contact and the channel, and wherein at least one of the plurality of current divider segments 140 is completely surrounded by the first diffusion region 122, formed in at least one of different shapes, sizes and orientations (positions) with respect to each other.

Art Unit: 2811

Regarding the claimed limitation of plurality of current divider segments randomly distributed within the first diffusion region, this feature is inherent in Hsu et al.'s structure for the following reason. The phrase randomly distributed within the first diffusion region can mean a set of elements having equal probability of occurrence within the first diffusion region. Hsu et al. teach plurality of current divider segments having equal probability of occurrence within the first diffusion region. Therefore, Hsu et al. teach plurality of current divider segments randomly distributed within the first diffusion region, as claimed.

Regarding claim 88, Hsu et al. teach centers of area of the rows are not aligned in a straight line.

Regarding claims 101 and 103, Hsu et al. teach a first gap/distance between first and second segments/centers of area being larger than a second gap/distance between third and forth segments/centers of area.

Regarding claims 123-124, Lin teaches in figure 8 a current divider segment having a first portion (a first portion can be arbitrarily taken as an edge of the current divider segment) oriented at an angle not parallel to the channel region, and a second portion oriented at a second angle to the first portion.

Art Unit: 2811

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 83-88, 92, 96, 99-116 and 121-124, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (5,721,439)

Lin teaches in figure 8 and related text an electrostatic discharge protection device, comprising: a substrate; a first diffusion region 87 formed in the substrate; a second diffusion region 88 formed in the substrate adjacent to and spaced from the first diffusion region; plurality of contacts contact 97 (figure 9) for making a conductive connection to the first diffusion region; a channel (the area under gate 80) formed in a third region between the first and second diffusion regions; and a plurality of current divider segments 84, 85, 86 unevenly distributed within the first diffusion region, wherein the different shapes are selected from a square, a circle, a cross shape, a T shape, a V shape, a U shape, and an L shape, and the plurality of segments includes a first row of segments; each one of the first row of segments has a center-of-area, the respective centers-of-area are not aligned, wherein the plurality of segments are formed of polysilicon segments, field oxide segments, or a combination of polysilicon and field

Art Unit: 2811

oxide segments, and wherein the segments include a first segment spaced apart by a first gap from an adjacent second segment; the segments further include a third segment spaced apart by a second gap from an adjacent fourth segment; and the first gap being larger than the second gap, wherein the second segment is the third segment, a dielectric layer 125 formed over the channel, a conductive element 126 formed over the dielectric layer, wherein the conductive element is a polysilicon gate element; and the dielectric layer is an oxide layer, wherein at least one of the segments is positioned between the at least one contact and the channel and wherein at least one of the plurality of current divider segments 140 is completely surrounded by the first diffusion region 122, formed in at least one of different shapes, sizes and orientations (positions) with respect to each other.

Regarding the claimed limitation of plurality of current divider segments randomly distributed within the first diffusion region, this feature is inherent in Lin's structure for the following reason. The phrase randomly distributed within the first diffusion region can mean a set of elements having equal probability of occurrence within the first diffusion region. Lin teaches plurality of current divider segments having equal probability of occurrence within the first diffusion region. Therefore, Lin teaches plurality of current divider segments randomly distributed within the first diffusion region, as claimed.



Art Unit: 2811

Lin does not teach in figure 8 plurality of contacts. Lin teaches in figure 9 plurality of contacts. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use plurality of contacts in the device of figure 8 in order to operate the device. Note that the device would not operate without contacts.

Regarding claim 86, Lin teaches substantially the entire claimed structure, as applied to claim 1 above, except stating that the largest dimension of each segment is less than or equal to substantially six times a length of the channel. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the largest dimension of each segment being less than or equal to substantially six times or 2.5 times a length of the channel in Lin's device, since it is within the skills of an artisan to adjust the dimension of each segment, subject to routine experimentation and optimization.

Regarding claim 88, Lin teaches centers of area of the rows are not aligned in a straight line.

Regarding claims 101 and 103, Lin teaches a first gap/distance between first and second segments/centers of area being larger than a second gap/distance between third and fourth segments/centers of area.

Art Unit: 2811

Regarding claims 99-100 and 111, Lin teaches segments include a first segment formed of a polysilicon layer over a dielectric layer (figure 4); and the second segment 86 formed by a LOCOS process of a field oxide layer (figure 8). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the first segment formed of a polysilicon layer over a dielectric layer; and the second segment formed of a field oxide layer in Lin's device in order to provide better ESD protection to the device.

Regarding claim 121, Lin teaches in figure 9 plurality of current divider segments, wherein each of the segments formed within the first diffusion region being closer to the channel than to the contact region.

Regarding claims 123-124, Lin teaches in figure 8 a current divider segment having a first portion (the edge of the current divider segment) oriented at an angle not parallel to the channel region, and a second portion oriented at a second angle to the first portion.

9. Claims 86, 99-100 and 110-111 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al.

Regarding claim 86, Hsu et al. teach substantially the entire claimed structure, as applied to claim 1 above, except stating that the largest dimension of each segment is less than or equal to substantially six times a length of the channel.

Art Unit: 2811

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the largest dimension of each segment being less than or equal to substantially six times or 2.5 times a length of the channel in Hsu et al.'s device, since it is within the skills of an artisan to adjust the dimension of each segment, subject to routine experimentation and optimization.

Regarding claims 99-100, Hsu et al. teach segments include a first segment formed of a polysilicon layer over a dielectric layer. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the first segment formed of a polysilicon layer over a dielectric layer; and the second segment formed of a field oxide layer in Hsu et al.'s device in order to provide better ESD protection to the device.

Regarding the processing limitations recited in claims 110-111 ("formed by one of a LOCOS process and a trench isolation process"), these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced.

Art Unit: 2811

***Response to Arguments***

10. Applicant argues that prior art does not teach plurality of current divider segments randomly distributed within the first diffusion region.

The phrase randomly distributed within the first diffusion region can mean a set of elements having equal probability of occurrence within the first diffusion region. prior art teaches plurality of current divider segments having equal probability of occurrence within the first diffusion region. Therefore, prior art teaches plurality of current divider segments randomly distributed within the first diffusion region, as claimed.

11. Applicant argues that prior art does not teach plurality of current divider segments with different sized gaps between segments in a first direction.

The gaps between plurality of current divider segments do not have to be taken only between adjacent segments. Therefore, prior art teaches plurality of current divider segments having different sized gaps between different segments in a first direction.

12. Applicant argues that there is support in the specification for plurality of current divider segments, wherein each of the segments formed within the first diffusion region being closer to the channel than to the contact region, as recited in claim 121, because the disclosure recites positioning the plurality of current divider segments such that the

Art Unit: 2811

weight or area center of all segments in the drain region is closer to the gate or channel region than to the drain contacts.

The recitation of positioning the plurality of current divider segments such that the weight or area center of all segments in the drain region is closer to the gate or channel region than to the drain contacts does not mean that each of the segments formed within the first diffusion region is closer to the channel than to the contact region, as recited in claim 121.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reference A is cited as being related to current divider segments.

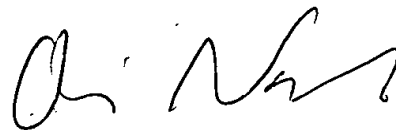
**Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722**

Art Unit: 2811

**and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.**

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is **(703) 308-8138**. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached at **(703) 308-2772**.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

A handwritten signature in black ink, appearing to read 'Ori Nadav', is positioned above the printed name and title.

O.N.  
June 11, 2003

ORI NADAV  
PATENT EXAMINER  
TECHNOLOGY CENTER 2800